Preview of Award 1501999 - Annual Project Report

Cover

Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Grant or Other Identifying Number Assigned by Agency:	1501999
Project Title:	PathTech LIFE: Constructing a National Survey of Engineering Technology Students through Regional and Statewide Testing
PD/PI Name:	William T Tyson, Principal Investigator Edward Fletcher, Co-Principal Investigator Danielly Orozco, Co-Principal Investigator
Recipient Organization:	University of South Florida
Project/Grant Period:	09/15/2015 - 08/31/2018
Reporting Period:	09/15/2015 - 08/31/2016
Submitting Official (if other than PD\PI):	N/A
Submission Date:	N/A
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	N/A

Accomplishments

* What are the major goals of the project?

The goal of this project is to develop a national survey of individuals completing coursework, certification, and AS/AAS degrees in advanced technologies at community colleges. The purpose of this survey is to determine how student pathways, career goals, and school-work-life balance influence program recruitment and retention. Because a large majority of participants are expected to be adults with numerous and complex life challenges (i.e., family, personal, school, and work), an investigation into their lived experiences is necessary to inform institutional efforts to support their success.

* What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?

Major Activities: The research team constructed an online pilot survey based on the PRiSM Decision Model for Adult Enrollment, Schlossberg's Transition Theory, and explanatory models from the recently completed PathTech Tampa Bay study (DUE #1104214). We compiled an expert panel made up of two persons each from FLATE, our six ATE Center partners, and our external evaluator, ICF, to review the online pilot survey using the Delphi Method. The objective of the Delphi Method was to use three rounds of review to establish a consensus (80% agreement) for which items should be included in the final pilot survey to be sent out to community college students. In Round 1, the expert panel filled out a survey asking them for each item if they agree with the wording and if not, to describe their concern and recommend changes. We revised the survey based on their feedback. In Round 2, the expert panel used feedback from other members of the panel and responded to changes to the survey. At this point, all survey items on which 80% of the panel approved were slated to be included in the pilot survey. In Round 3, we solicited feedback from the expert panel on the remaining four questions that did not reach 80% agreement.

From there, we completed the survey and distributed it to the ATE Center partners to distribute at their institution or a partner institution. We sent the ATE Center partners solicitation emails with links to the survey. We received feedback from partners on how to word the email and sent several solicitation emails over a three-week period from May 6 to May 27. We closed the pilot survey on May 31 with 97 participants.

Specific Objectives: The primary objectives of Year 1 were to distribute a pilot survey, analyze the data, and use the analyses to construct a national survey to distribute in Year 2. At this point, we have incorporate project findings and feedback from our external evaluators and expert panel to construct a near final draft of the 2016-17 PathTech LIFE survey. The remaining step in developing the survey is to complete the Think Aloud exercise at Hillsborough Community College that was originally slated for Year 1. We will complete this step during the first two weeks of the Fall semester in late August or early September.

Significant Results: A total of 97 participants responded to the PathTech LIFE questionnaire for the pilot. These participants were from two-year colleges across the nation and were currently enrolled in an advanced technologies degree/certificate program. Based on results, we were able to identify a profile of two-year college students in advanced technologies degree/certificate programs. Below are demographic, performance, and LIFE characteristics of the participants:

- · 40% were employed less than 35 hours

- · 34% enrolled in career and technical education-related courses in high school

- · 78% were enrolled in school full-time

- · Average GPA is 3.5

- · The students most strongly agreed that they enrolled in their programs because they were willing to make the effort to complete the program (3.76 out of 4.00 Likert scale)

- · 89% of students were working toward a degree and 21% were working toward a certificate

- · 85% believed their program would help them secure a higher paying job

- · 80% believed their program would provide them with personal fulfillment

- · 71% planned to earn a baccalaureate degree in their future

- · The average age of the participants was 27; the median age was 24

- · 83% were male

- · 71% were white, 12% Hispanic/Latino, 9% African American/Black, 7% Asian, 1% Middle Eastern or North African

We also conducted a principal components analysis to establish construct validity of items derived from the PRiSM Decision Model for Adult Enrollment. Analyses determined the extent to which items reliably measure each theme and the extent to which each theme influenced participants' decision to enroll that semester. We derived six scales representing the four PRiSM themes (using Questions 15, 16, 17, and 23). Results of reliability tests and mean scale score among all participants (ranging 1 to 4 with 4 being highest) are presented below:

- · Pathway to a better life: 7 items out of 12, Cronbach's alpha = .88, mean score = **3.20**

- · Reflective learner (Inclination): 4 items out of 8, Cronbach's alpha = .73, mean score = **2.70**

- · Reflective learner (Prior academic success): 3 items out of 8, Cronbach's alpha = .79, mean score = **3.27**

- · Synchronizing learning, earning, and living: 4 items out of 8, Cronbach's alpha = .79, mean score = **2.24**

- · Match with an academic life (Institutional support): 4 items out of 13, Cronbach's alpha = .81, mean score = **2.60**

- · Match with an academic life (Program fit): 6 items out of 13, Cronbach's alpha = .90, mean score = **3.12**

Using .70 as a threshold, each constructs related to the PRiSM model are reliable. These results suggest prior academic success is the primary motivation to enroll followed by a pathway to a better life (i.e. Advance in current job, gain credentials, improve status in community) and program fit (i.e. Program accommodates work schedules, flexibility of course structures). Timing of life events (Synchronizing) was the least influential factor at 2.24 out of 4 although a majority of students did agree that decreases in financial concerns, family challenges, and job responsibilities encouraged them to enroll. Students over 35 were more likely to consider timing in their decision. Overall, there were few age differences.

Key outcomes or Other achievements:	A key Year 1 outcome was developing connections between the USF research team and ATE Center partners. Co-PI Danielly Orozco and FLATE PI Marilyn Barger contacted potential the PIs of potential ATE Center partners on behalf of the entire PathTech LIFE research team in order to gauge their interest in participating in the

project. They also set up face-to-face meetings between interested PIs and PathTech LIFE PI Will Tyson and Co-PI Eddie Fletcher at the ATE Principal Investigators Conference in October 2015. We secured commitments from PIs at this stage. Over the course of Year 1, the project team remained in contact with at least two personnel from each ATE Center.

The primary objectives of Year 1 were to distribute a pilot survey, analyze the data, and use the analyses to construct a national survey to distribute in Year 2. At this point, we have incorporated project findings and feedback from our external evaluators and expert panel to construct a near final draft of the 2016-17 PathTech LIFE survey. We also sent out the PathTech LIFE survey with 97 participants responding.

* What opportunities for training and professional development has the project provided?

The project has not provided training and professional development opportunities to this point.

* How have the results been disseminated to communities of interest?

The PathTech LIFE project goals/objectives and timeline was shared with participants at the Engineering Technology (ET) Forum on March 31st, 2016 located at Lake-Sumter State College. Representatives from 14 two-year colleges, the Florida Department of Education, and local industry participated.

Select results of the pilot survey have been distributed to the principal investigators of the seven partner ATE Centers.

* What do you plan to do during the next reporting period to accomplish the goals?

We plan to accomplish goals by distributing the PathTech LIFE 2016-17 Survey from September 2016 through April 2017 and conducting analyses through the end of Year 2.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
PathTech LIFE Pilot Survey.pdf	PathTech LIFE Pilot Survey distributed to community college students from May 6-27, 2016.	William Tyson	08/31/2016
Delphi Round 2 Report (15 responses).pdf	Round 2 report from Delphi Study of expert panelists made up of representatives from partner ATE Centers.	William Tyson	08/31/2016
Pilot Survey Final Report 6-2.pdf	PathTech LIFE Pilot Survey Final Report from Qualtrics	William Tyson	08/31/2016
PathTech LIFE Updates and Pilot Survey Results.pdf	PathTech LIFE update and Pilot Survey results emailed to ATE Center partners at the beginning of August.	William Tyson	08/31/2016

Products

Books

Book Chapters

Inventions

Journals or Juried Conference Papers

Will Tyson Edward C. Fletcher (2016). Examining Enrollment Decisions and Life Challenges of Adult Learners in Engineering Technology. *Juried Conference Paper*. . Status = SUBMITTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Licenses

Other Conference Presentations / Papers

Will Tyson Edward C. Fletcher (2016). *PathTech Update*. Florida Forum on Engineering Technology. Lake Sumter State College, Sumterville, FL. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Other Products

Survey Instruments.

The PathTech LIFE Pilot Survey was distributed to students in advanced technology courses through PIs at partner ATE Centers.

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites
Supporting Files

Filename	Description	Uploaded By	Uploaded On
PathTech LIFE Year 1 External Evaluation Report (ICF Aug 2016).pdf	ICF External Evaluator report	William Tyson	08/31/2016
PathTech LIFE Survey Draft (August 2016).pdf	This is the current state of the survey. Revisions are in process based on results of the pilot survey and input from ICF. This draft will be completed in early September in time to conduct a think aloud activity.	William Tyson	08/31/2016
PathTech LIFE Update - Spring 2016 ET Forum.pdf	Handout for PathTech LIFE Update at Spring ET Forum hosted by FLATE	William Tyson	08/31/2016
AERA 2017 Proposal - Fletcher & Tyson.pdf	Paper submitted for the 2017 meetings of the American Educational Research Association that summarizes pilot survey findings	William Tyson	08/31/2016

Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Tyson, Will	PD/PI	2
Fletcher, Edward	Co PD/PI	2
Orozco, Danielly	Co PD/PI	1

Full details of individuals who have worked on the project:

Will Tyson
Email: wtyson@usf.edu
Most Senior Project Role: PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Dr. Tyson leads all research effort in this project including leading the USF based research team. Dr. Tyson administers the survey and leads revision efforts. He also is the primary contact for ATE Center partners and student survey participants.

Funding Support: Dr. Tyson is supported by the PathTech LIFE award.

International Collaboration: No
International Travel: No

Edward Fletcher
Email: ecfletcher@usf.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 2

Contribution to the Project: Dr. Fletcher assists Dr. Tyson in overseeing all project activity. Dr. Fletcher wrote the initial draft of the PathTech LIFE Pilot Survey and led efforts to revise the survey before it was distributed to students.

Funding Support: Dr. Fletcher is supported by the PathTech LIFE award.

International Collaboration: No
International Travel: No

Danielly Orozco
Email: dorozco2@hccfl.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 1

Contribution to the Project: Ms. Orozco represents FLATE in their partnership with USF. She helps coordinate communication between the USF based research team and partner ATE Centers. She is also part of the expert panel made up of ATE Center leadership.

Funding Support: Ms. Orozco is supported by the FLATE subaward from the PathTech LIFE award.

International Collaboration: No

International Travel: No

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
CARCAM	Academic Institution	Gadsden, AL
CREATE	Academic Institution	Santa Clarita, CA
ICF	Industrial or Commercial Firms	Washington, DC
MatEdU	Academic Institution	Lynnwood, WA
NEATEC	Academic Institution	Troy, NY
RCNET	Academic Institution	Fort Pierce, FL
RCNGM	Academic Institution	Farmington, CT

Full details of organizations that have been involved as partners:

CARCAM

Organization Type: Academic Institution
Organization Location: Gadsden, AL

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Consortium for Alabama Regional Center for Automotive Manufacturing (CARCAM) is an ATE Center. In consultation with our partners at FLATE, we decided the most efficient way to conduct a national survey of students enrolled in technician education programs at community colleges throughout the US is to partner with ATE Centers. Each center trains students to be production based tech in one of four technological areas: (1) Micro and Nano Technologies, (2) Engineering Technologies, (3) Advanced Manufacturing Technologies, and (4) Energy and Environmental Technologies. Each ATE Center agreed to complete the following Year 1 tasks as part of their PathTech collaboration: (1) Two representatives from each center reviewed the pilot online survey and made recommendations over three stages using the Delphi method; (2) The center distributed the pilot online survey to students enrolled at the host institution or other institutions if necessary. The center received a $5000 stipend for their cooperation.

CREATE

Organization Type: Academic Institution
Organization Location: Santa Clarita, CA

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: California Regional Consortium for Engineering Advances in Technological Education (CREATE) is an ATE Center. In consultation with our partners at FLATE, we decided the most efficient way to

conduct a national survey of students enrolled in technician education programs at community colleges throughout the US is to partner with ATE Centers. Each center trains students to be production based tech in one of four technological areas: (1) Micro and Nano Technologies, (2) Engineering Technologies, (3) Advanced Manufacturing Technologies, and (4) Energy and Environmental Technologies. Each ATE Center agreed to complete the following Year 1 tasks as part of their PathTech collaboration: (1) Two representatives from each center reviewed the pilot online survey and made recommendations over three stages using the Delphi method; (2) The center distributed the pilot online survey to students enrolled at the host institution or other institutions if necessary. The center received a $5000 stipend for their cooperation.

ICF

Organization Type: Industrial or Commercial Firms
Organization Location: Washington, DC

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: ICF is the external evaluator on this project. Two members of the ICF team reviewed the pilot survey along with personnel from partner ATE Centers. ICF assisted in pilot data analysis and made recommendations for revisions.

MatEdU

Organization Type: Academic Institution
Organization Location: Lynnwood, WA

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: National Resource Center for Materials Technology Education (MatEdU) is an ATE Center. In consultation with our partners at FLATE, we decided the most efficient way to conduct a national survey of students enrolled in technician education programs at community colleges throughout the US is to partner with ATE Centers. Each center trains students to be production based tech in one of four technological areas: (1) Micro and Nano Technologies, (2) Engineering Technologies, (3) Advanced Manufacturing Technologies, and (4) Energy and Environmental Technologies. Each ATE Center agreed to complete the following Year 1 tasks as part of their PathTech collaboration: (1) Two representatives from each center reviewed the pilot online survey and made recommendations over three stages using the Delphi method; (2) The center distributed the pilot online survey to students enrolled at the host institution or other institutions if necessary. The center received a $5000 stipend for their cooperation.

NEATEC

Organization Type: Academic Institution
Organization Location: Troy, NY

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Northeast Advanced Technological Education Center (NEATEC) is an ATE Center. In consultation with our partners at FLATE, we decided the most efficient way to conduct a national survey of students enrolled in technician education programs at community colleges throughout the US is to partner with ATE Centers. Each center trains students to be production based tech in one of four technological areas: (1) Micro and Nano Technologies, (2) Engineering Technologies, (3) Advanced Manufacturing Technologies, and (4) Energy and

Environmental Technologies. Each ATE Center agreed to complete the following Year 1 tasks as part of their PathTech collaboration: (1) Two representatives from each center reviewed the pilot online survey and made recommendations over three stages using the Delphi method; (2) The center distributed the pilot online survey to students enrolled at the host institution or other institutions if necessary. The center received a $5000 stipend for their cooperation.

RCNET

Organization Type: Academic Institution
Organization Location: Fort Pierce, FL

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Regional Center for Nuclear Education and Training (RCNET) is an ATE Center. In consultation with our partners at FLATE, we decided the most efficient way to conduct a national survey of students enrolled in technician education programs at community colleges throughout the US is to partner with ATE Centers. Each center trains students to be production based tech in one of four technological areas: (1) Micro and Nano Technologies, (2) Engineering Technologies, (3) Advanced Manufacturing Technologies, and (4) Energy and Environmental Technologies. Each ATE Center agreed to complete the following Year 1 tasks as part of their PathTech collaboration: (1) Two representatives from each center reviewed the pilot online survey and made recommendations over three stages using the Delphi method; (2) The center distributed the pilot online survey to students enrolled at the host institution or other institutions if necessary. The center received a $5000 stipend for their cooperation.

RCNGM

Organization Type: Academic Institution
Organization Location: Farmington, CT

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Regional Center for Next Generation Manufacturing (RCNGM) is an ATE Center. In consultation with our partners at FLATE, we decided the most efficient way to conduct a national survey of students enrolled in technician education programs at community colleges throughout the US is to partner with ATE Centers. Each center trains students to be production based tech in one of four technological areas: (1) Micro and Nano Technologies, (2) Engineering Technologies, (3) Advanced Manufacturing Technologies, and (4) Energy and Environmental Technologies. Each ATE Center agreed to complete the following Year 1 tasks as part of their PathTech collaboration: (1) Two representatives from each center reviewed the pilot online survey and made recommendations over three stages using the Delphi method; (2) The center distributed the pilot online survey to students enrolled at the host institution or other institutions if necessary. The center received a $5000 stipend for their cooperation.

What other collaborators or contacts have been involved?
Nothing to report

Impacts

What is the impact on the development of the principal discipline(s) of the project?

A research gap exists related to identifying the profiles (demographic characteristics, life, interests, family, and employment) of engineering technology and other advanced technologies' students. Further, little is known regarding their decisions to

enroll in their degree/certificate programs. This study will provide insight into the factors related to enrollment and challenges they encounter influencing their retention.

What is the impact on other disciplines?

A wealth of research has examined why adults participate in degree programs within the adult education and higher education literature. However, research has failed to include the decisions of sub-baccalaureate students, particularly those in STEM fields such as engineering technology. Further, researchers have identified the PRiSM model as a result of an extensive review of the literature, but studies have not transformed the model into a research instrument that is reliable and valid. Such an instrument can then be used with other programs and other samples such as baccalaureate, graduate, and continuing education students.

What is the impact on the development of human resources?

Results of our study has the potential to provide institutional knowledge regarding the backgrounds and challenges of students pursuing two-year degrees and certificates in advanced technologies. As such, institutions can begin to provide supports to accommodate their diverse student population and to assist with their retention.

What is the impact on physical resources that form infrastructure?
Nothing to report.

What is the impact on institutional resources that form infrastructure?
Nothing to report.

What is the impact on information resources that form infrastructure?
Nothing to report.

What is the impact on technology transfer?
Nothing to report.

What is the impact on society beyond science and technology?

The project yields insights on how students decide to enroll from term to term. We also seek to learn how students balance school, work, and family responsiblities.

Changes/Problems

Changes in approach and reason for change

We originally planned to conduct a think-aloud activity in which we would observe students enrolled in engineering technology courses at HCC as they completed a draft of the pilot survey. This was to be the last step before distributing the pilot survey. We decided to distribute the pilot survey before conducting the think-aloud because the Spring semester was ending at some of our partner institutions and we feared waiting any longer would reduce the pool of eligible students available to complete the survey.

Actual or Anticipated problems or delays and actions or plans to resolve them

We plan to address the above issue by conducting the think-aloud activity at the end of August. This would give us plenty of time to make final changes to the survey and distribute it to ATE Center partners in September.

Changes that have a significant impact on expenditures

The budget for Participant Costs included $5000 for seven ATE Center partners each for Year 1 and Year 2. We decided that recruiting six ATE Center partners was sufficient for the project, so the $10,000 reserved for a seventh partner is available to be used for $25 incentives for survey participants. In effect, we can afford to have more people complete the survey.

Significant changes in use or care of human subjects
Nothing to report.

Significant changes in use or care of vertebrate animals
Nothing to report.

Significant changes in use or care of biohazards
Nothing to report.

Special Requirements

Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.
Nothing to report.